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**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

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| In re Application of: Roger Hoyland | ) | |
| Serial No. Unknown | ) | |
| Filing Date: April 4, 2000 | ) | Examiner: Unknown |
| For: A WIDEBAND 180° MICROWAVE PHASE SWITCH | ) | Group Art Unit No. Unknown |

**PRELIMINARY AMENDMENT**

Commissioner for Patents
Washington, D.C. 20231

Dear Sir:

Prior to examination of the above-identified application, please amend the application as follows:

**In The Title of the Invention**

This application is for the United States National Filing stage of a PCT application with the Serial No. WO O1/76003 A1 filed on April 4, 2000,which is hereby incorporated by reference.

**In the Claims**

Please cancel Claims 1-10 and add new Claims 11-20 as follows:

11. (New) A wideband 180° microwave phase switch structure in microwaves, or millimetric waves, characterized by being constituted by means of a microwave or millimetric wave

circuit with two possible input ports and another two output ports in such a way that only an input and an output ports in such a way that only an input and an output are simultaneously connected to an exterior circuit. The other input and output remains disconnected from the exterior circuit. Each input and output port is connected by means of a transmission or waveguide line of equal length to half the length of wave corresponding to the central frequency of a specific band, with the particularity that each line has a root of two impedance multiplied by the characteristic impedance of the system it belongs to, provided that each input port is connected to a different output port by means of a transmission or waveguide line with equal length to half the length of wave corresponding to the central frequency of the specific band ,with a characteristic root of two impedance multiplied by the characteristic impedance of the system it belongs to, and that the central points of the transmission or waveguide lines between the input and the output ports are connected by means of a transmission or waveguide line, the length of which is equal to half the length of wave corresponding to the central frequency of the specific band, with an impedance equal to the characteristic impedance of the system it belongs to, divided by the root of two.

12. (NEW) A wideband 180° microwave phase switch structure according to Claim 11, characterized in that it incorporates optimization means of the impedances of each transmission or waveguide line in order to obtain a 180° phase difference between a specific input signal measured at each output of the structure and to improve the transmission loss and return loss in a specific bandwidth.

13.(NEW) A wideband 180° microwave phase switch structure according to Claim 13, characterized in that it is constituted by FET transistor, HEMT transistor or PIN diode types of switches connected in series to each input port, output port or to all of them.

14. (NEW) A wideband 180° microwave phase switch structure according to Claim 12, characterized in that it is constituted by FET transistor, HEMT transistor or PIN diode types of switches connected in series to each input port, output port or to all of them.

15. (NEW) A wideband 180° microwave phase switch structure according to Claim 13, characterized in that each input with connected switch is connected to one single input port and each output with connected switch to one single output port, in such a way, that the input or output of an exterior circuit can be switched between the input or output ports of the structured with connected switches.

16. (NEW) A wideband 180° microwave phase switch structure according to Claim 14, characterized in that each input with connected switch is connected to one single input port and each output with connected switch to one single output port, in such a way, that the input or output of an exterior circuit can be switched between the input or output ports of the structured with connected switches.

17. (NEW) A wideband 180° microwave phase switch structure according to Claim 13, characterized in that each connected switch is connected to one single input port and each output with switch connected to one single output port by means of a transmission or

waveguide line or equal length to half the length of wave corresponding to the central frequency of a specific band with an equal impedance to the characteristic impedance of the system it belongs to, in such a way, that the input or output of an exterior circuit can switch between the input or output ports of the structure with connected switches.

18. (NEW) A wideband 180° microwave phase switch structure according to Claim 14, characterized in that each connected switch is connected to one single input port and each output with switch connected to one single output port by means of a transmission or waveguide line or equal length to half the length of wave corresponding to the central frequency of a specific band with an equal impedance to the characteristic impedance of the system it belongs to, in such a way, that the input or output of an exterior circuit can switch between the input or output ports of the structure with connected switches.

19. (NEW) A wideband 180° microwave phase switch structure according to Claim 13, characterized in that each input with switch is connected to one single input port and each output with switch is connected to one single output port by means of a transmission or waveguide line of any length with an equal impedance to the characteristic impedance of the system it belongs to and that is terminated by a FET transistor, HEMT transistor or PIN diode type of switch in series, in such a way that the input or output of an exterior circuit can be switched between the input or output ports of the structure that has switches connected.

20. (NEW) A wideband 180° microwave phase switch structure according to Claim 14, characterized in that each input with switch is connected to one single input port and each

output with switch is connected to one single output port by means of a transmission or waveguide line of any length with an equal impedance to the characteristic impedance of the system it belongs to and that is terminated by a FET transistor, HEMT transistor or PIN diode type of switch in series, in such a way that the input or output of an exterior circuit can be switched between the input or output ports of the structure that has switches connected.

## REMARKS

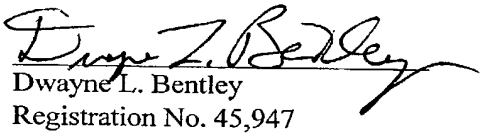
Applicant has canceled Claims 1-10 and added new Claims 11-20. The specification supports the addition of the new claims. No new matter has been added. Applicant respectfully requests the Examiner to consider and allow the new claims.

The changes from the previous version to the rewritten version are shown in attached Appendix A, with underlines for added matter.

This application was not published in English.

Therefore in view of the above amendments, Applicant respectfully submits that this application is in condition for allowance and such action is earnestly requested. If for any reason, however, the Examiner feels that a telephone interview would be helpful in resolving any remaining issues the Examiner is respectfully requested to contact Applicant's undersigned attorney.

Respectfully submitted,



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**APPENDIX A**

**Serial No. Unknown**

**A WIDEBAND 180° MICROWAVE PHASE SWITCH**

**R. Hoyland**

11. (New) A wideband 180° microwave phase switch structure in microwaves, or millimetric waves, characterized by being constituted by means of a microwave or millimetric wave circuit with two possible input ports and another two output ports in such a way that only an input and an output ports in such a way that only an input and an output are simultaneously connected to an exterior circuit. The other input and output remains disconnected from the exterior circuit. Each input and output port is connected by means of a transmission or waveguide line of equal length to half the length of wave corresponding to the central frequency of a specific band, with the particularity that each line has a root of two impedance multiplied by the characteristic impedance of the system it belongs to, provided that each input port is connected to a different output port by means of a transmission or waveguide line with equal length to half the length of wave corresponding to the central frequency of the specific band ,with a characteristic root of two impedance multiplied by the characteristic impedance of the system it belongs to, and that the central points of the transmission or waveguide lines between the input and the output ports are connected by means of a transmission or waveguide line, the length of which is equal to half the length of wave corresponding to the central frequency of the specific band, with an impedance equal to the characteristic impedance of the system it belongs to, divided by the root of two.

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15. (NEW) A wideband 180° microwave phase switch structure according to Claim 13, characterized in that each input with connected switch is connected to one single input port and each output with connected switch to one single output port, in such a way, that the input or output of an exterior circuit can be switched between the input or output ports of the structured with connected switches.

16. (NEW) A wideband 180° microwave phase switch structure according to Claim 14, characterized in that each input with connected switch is connected to one single input port and each output with connected switch to one single output port, in such a way, that the input

or output of an exterior circuit can be switched between the input or output ports of the structured with connected switches.

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18. (NEW) A wideband 180° microwave phase switch structure according to Claim 14, characterized in that each connected switch is connected to one single input port and each output with switch connected to one single output port by means of a transmission or waveguide line or equal length to half the length of wave corresponding to the central frequency of a specific band with an equal impedance to the characteristic impedance of the system it belongs to, in such a way, that the input or output of an exterior circuit can switch between the input or output ports of the structure with connected switches.

19. (NEW) A wideband 180° microwave phase switch structure according to Claim 13, characterized in that each input with switch is connected to one single input port and each output with switch is connected to one single output port by means of a transmission or waveguide line of any length with an equal impedance to the characteristic impedance of the

system it belongs to and that is terminated by a FET transistor, HEMT transistor or PIN diode type of switch in series, in such a way that the input or output of an exterior circuit can be switched between the input or output ports of the structure that has switches connected.

20. (NEW) A wideband 180° microwave phase switch structure according to Claim 14, characterized in that each input with switch is connected to one single input port and each output with switch is connected to one single output port by means of a transmission or waveguide line of any length with an equal impedance to the characteristic impedance of the system it belongs to and that is terminated by a FET transistor, HEMT transistor or PIN diode type of switch in series, in such a way that the input or output of an exterior circuit can be switched between the input or output ports of the structure that has switches connected.